IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF WISCONSIN

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SILICON GRAPHICS, INC.   :
                                                :
              Plaintiff,   :   Civil Action No. 06-C-0611-C
                                                :
     v.   :
                                                :
ATI TECHNOLOGIES, INC.   :
ATI TECHNOLOGIES ULC and   :
ADVANCED MICRO DEVICES, INC.,   :
                                                :
             Defendants.   :

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DEPOSITION DIGEST TRANSCRIPTS

     Plaintiff Silicon Graphics, Inc. ("SGI") hereby submits the following Deposition

Designation Transcript for those portions of the depositions of Robert Drebin, Mark Leather,

Danny Loh and Mark Peercy played in live court on February 7-8, 2008.

Dated: February 11, 2008   Respectfully submitted,

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Case Clip(s) Detailed Report
Thursday, February 07, 2008, 9:49:34 PM

SGI v ATI - Trial

📁 **PEERCY, MARK S. (Vol. 01) - 05/18/2007**   1 CLIP (RUNNING 00:16:57.700)

📇 Invalidty no obj

MP-*   **14 SEGMENTS (RUNNING 00:16:57.700)**

1. PAGE 18:12 TO 18:18 (RUNNING 00:00:23.100)

```
12  Q    Why did you join Silicon Graphics in 1994?
13  A    Because I was very enthusiastic about working in 3D
14  rendering and realtime rendering.
15  Q    Certainly there were other companies that did that.
16  Why did you pick Silicon Graphics?
17  A    Silicon Graphics was at its peak and a very
18  exciting opportunity.
```

2. PAGE 18:19 TO 18:24 (RUNNING 00:00:09.900)

```
19  Q    Did you receive offers from other companies to work
20  in 3D rendering?
21  A    I did not.
22  Q    Did you seek offers from anybody else in 3D
23  rendering?
24  A    I did not.
```

3. PAGE 20:01 TO 20:09 (RUNNING 00:00:27.800)

```
00020:01  Q    You said that Silicon Graphics was at its peak when
02  you joined.  Did you understand at that time when you
03  joined Silicon Graphics that you were the state of the
04  art -- had the state of the art technology in 3D
05  rendering?
06  A    I did.
07  Q    And was that one of the reasons you chose to work
08  at Silicon Graphics?
09  A    It is.
```

4. PAGE 64:02 TO 64:22 (RUNNING 00:01:30.500)

```
02  Q    I'd like to talk a little bit about the work that
03  led up to the '327 patent, and I think we discussed it
04  briefly as coming out of the Bali project.  Do you
05  recall that?
06  A    I do recall that.
07  Q    And specifically, do you recall discussions early
08  on about enhancing shading as it was implemented in the
09  InfiniteReality with John Airey?
10  A    I do.
11  Q    What do you recall about those discussions?
12  A    We had a number of technology demonstrations that
13  rode on InfiniteReality as a platform that demonstrated
14  the potential advantage of programmable shading.  And we
15  recognized the deficiencies of the InfiniteReality
16  hardware specifically in enabling us to do the kinds of
17  things that we were investigating.
18  Q    And specifically, that related to the use of fixed
19  point formats through -- in the rasterization in the
20  framebuffer?
21  A    It had to do with use of fixed point in certain
22  portions of the InfiniteReality pipeline.
```

5. PAGE 65:04 TO 65:19 (RUNNING 00:01:14.000)

```
04  Q    Do you recall any sort of specific discussion of
05  the need to have floating point pixel values stored in a
```

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06  framebuffer, as you define it, in your work on Bali?
07  A    I do.
08  Q    And what was the importance of having floating
09  point values in a framebuffer for Bali?
10  A    So the hardware that SGI was designing was an
11  implementation of the OpenGL standard, and the OpenGL
12  pipeline has a specific architecture.  And as a result,
13  it itself imposes constraints on where data can be
14  brought into the system and where data can be sent out
15  of the system.  One of our objectives in the development
16  of our technology was to minimize the change that would
17  need to happen between a graphics architecture, such as
18  InfiniteReality, in order to support programmable
19  shading, and those fed into the Bali discussion.
```

6. PAGE 65:20 TO 65:25 (RUNNING 00:00:14.900)

```
20  Q    Okay.  The idea that if you -- strike that.
21        In programmable shaders as you were working on
22  at that time, were pixel values stored in a framebuffer
23  recycled through the pipeline?
24  A    At the time?
25  Q    Yes.
```

7. PAGE 66:01 TO 66:15 (RUNNING 00:00:41.200)

```
00066:01  A    Our implementation recycled pixel values through
02  the graphics pipeline.
03  Q    And they would come from the framebuffer in
04  floating point format?
05  A    Could you clarify whether we're talking
06  InfiniteReality experiments or --
07  Q    No.  I'm talking about the work you did on Bali.
08  A    So the work that we did on Bali.  So our work
09  primarily was on OpenGL software simulators --
10  Q    Right.
11  A    -- which would have been implemented in hardware by
12  the Bali hardware team.  In the OpenGL software
13  simulators, we extended what the OpenGL pipeline
14  describes as the framebuffer to support floating point
15  values.
```

8. PAGE 69:10 TO 69:12 (RUNNING 00:00:22.700)

```
10  Q    Let me ask it the way I asked it, though.  Were you
11  proponents of moving to a full floating point graphics
12  pipeline as described in the '327 patent?
```

9. PAGE 69:14 TO 71:25 (RUNNING 00:03:38.000)

```
14        THE WITNESS:  So John Airey and I extended the
15  OpenGL architecture by introducing floating points --
16  floating point at different points in the OpenGL
17  pipeline.  Bali was a hardware implementation of the
18  OpenGL architecture that we had designed.  And so to the
19  extent that Bali reflected the OpenGL architecture that
20  we were working on, we were proponents of introducing
21  floating point in the texture unit, in other portions of
22  the graphics pipeline.
23        MR. BOLLINGER:  Q.  What other portions of the
24  graphics pipeline were you proponents of introducing
25  floating point format?
00070:01  A    So we chose to -- in our implementation chose to
02  extend the framebuffer, where framebuffer is defined as
03  that portion of memory that is scanned out for display,
04  to hold floating point.  We also suggested introducing
05  floating point in the scan converter, which takes color
06  values from vertices on a triangle and scan-converts
07  them to pixels, as well as the texture unit.
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        08   Q     You were proponents of doing those parts of the
        09   rasterization process in floating point?
        10   A     We were.
        11   Q     And you were proponents of storing data, pixel
        12   data, in the framebuffer; is that correct?
        13   A     That's correct.
        14   Q     And you were also proponents of pulling pixel data
        15   stored in the framebuffer and recycling it?
        16   A     We were.
        17   Q     And that data being in floating point format?
        18   A     In our implementation, yes, that data was in
        19   floating point format.
        20   Q     And you did that in full software emulation?
        21   A     We did.
        22   Q     And what were the advantages when you did it that
        23   way?
        24   A     The primary advantage is that when you took one
        25   pass through the graphics pipeline --
00071:01   Q     Right.
        02   A     -- you could preserve all of the information or the
        03   bulk of the information that had been computed during
        04   that pass in order to use it later.
        05         What this enables is the ability outside the
        06   graphics pipeline to dissect a particular operation into
        07   component pieces, each of which could be executed on the
        08   graphics pipeline so that an application could work at a
        09   much higher level of abstraction.
        10   Q     By using floating point data for storage of pixel
        11   values in the framebuffer, do you avoid clamping and
        12   loss of precision and range associated with values as
        13   they go through the pipeline and when you recycle those
        14   values?
        15   A     Yes.
        16   Q     And that's a benefit?
        17   A     That is a benefit.
        18   Q     And were you able to demonstrate that benefit when
        19   you did that work on the Bali project?
        20   A     We were able to demonstrate that benefit in the
        21   software --
        22   Q     Simulator?
        23   A     -- simulator.  And to the extent that the software
        24   simulator was encoded in the hardware, that benefit
        25   would carry over.
```

10. PAGE 105:18 TO 106:02 (RUNNING 00:01:03.300)

```
        18           MR. BOLLINGER:  Q.  Do you recall the
        19   simulator simulating a floating point framebuffer?
        20   A     I do.
        21   Q     Do you know who added that to the simulator, that
        22   capability?
        23   A     I don't recall for certain.
        24   Q     Do you recall when that work was done?
        25   A     Not specifically, although it would have been at
00106:01   the earliest at the end of '96 to '97 to '98 kind of
        02   time frame.
```

11. PAGE 109:25 TO 111:20 (RUNNING 00:02:36.300)

```
        25   Q     And at some point, do you recall that it had been
00110:01   canceled?
        02   A     I recall that it was canceled.
        03   Q     Do you know why it was canceled?
        04   A     I do.
        05   Q     I'm sorry?
        06   A     I do.
        07   Q     What was the reason that you understood?
        08   A     My understanding is that the product was not going
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         09  to be deliverable.
         10  Q    And who did you gain that understanding from?
         11  A    It came, in part, from my own assessment as
         12  feedback to the team.
         13  Q    How far along had the product developed by the time
         14  they decided to cancel it?
         15  A    I believe that it was in simulation phase, so that
         16  at least some portions of the system could be simulated.
         17  Q    When you say simulation phase, do you mean -- what
         18  do you mean precisely?
         19  A    So the way that we developed the chips at SGI was
         20  to write simulators in programming language such as C so
         21  that you could provide stimulus to the system and see
         22  how it might perform before you chose to what's known as
         23  tape it out, which is deliver the chips and have them
         24  produced.
         25  Q    Do you know whether these simulations had been run
00111:01  for more than -- strike that.
         02          Which chips had been simulated at the time
         03  that it had been canceled; do you know?
         04  A    I do not know for certain.
         05  Q    What is your understanding as you sit here today?
         06  A    So my understanding is that some functionality in
         07  all of the chips would need to have been simulated.
         08  Q    My question is how much had that been already done?
         09  Do you know whether the functionality for the R Chip had
         10  been fully simulated?
         11  A    So that I don't know.
         12  Q    Do you know whether the function for the G Chip had
         13  been fully simulated?
         14  A    I don't know.
         15  Q    Or the N Chip?
         16  A    (Witness shakes head.)
         17  Q    Or the M Chip?
         18  A    I don't know.
         19  Q    So it could have been that all the simulations had
         20  been completed, you don't know at this point?
```

12. PAGE 111:23 TO 113:20 (RUNNING 00:03:45.200)

```
         23          THE WITNESS:  That could have been true.
         24          MR. BOLLINGER:  Q.  And do you know the
         25  results of any of the simulations that were run on the
00112:01  chips?
         02  A    I don't recall specifically.
         03  Q    Did anybody tell you that the product could not --
         04  was not deliverable?
         05  A    So I had conversations which tried to determine
         06  whether we were converging from an engineering
         07  standpoint on delivery of the product.
         08  Q    And who were those conversations with?
         09  A    I recall a conversation with Brian Cabral.
         10  Q    What was -- What do you recall about his
         11  assessment?
         12  A    I recall we shared a concern for the challenge that
         13  the team was facing delivering the product.
         14  Q    And what in particular -- what aspect of the
         15  product was causing the challenge?
         16  A    My belief is that the product was not rescoped when
         17  the skill set of the team changed, when people on the
         18  team, important people on the team, were leaving the
         19  project.
         20  Q    When you say rescoped, what did you mean?  Scaled
         21  back?
         22  A    So a team can deliver -- a given team has the
         23  capability to deliver a certain device.  And if you have
         24  more skilled people, you might be able to deliver a
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        25  grander device.  So scaled back is one option, for
00113:01  example, for dealing with the change in the team.
        02  Q    And at the time that the product had -- the Bali
        03  project had been canceled, there was a substantial
        04  exodus of graphics engineers from Silicon Graphics?
        05  A    Yes.
        06  Q    People like Mr. Buchner, Mr. Drebin had departed.
        07  A    Yes.
        08  Q    Mr. Leather, I think, had left by that time, too?
        09  A    Yes.
        10  Q    Gordon Elders, he had gone by then?
        11  A    I don't recall Gordon's specific time of departure.
        12  Q    Mr. Montrym had departed by then, too?
        13  A    Yes.
        14  Q    Mark Grossman, was he gone, also?
        15  A    I believe so.
        16  Q    Do you know whether Mr. Loh was still there at that
        17  point or not?
        18  A    I don't know for certain.
        19  Q    How about Mr. Baum?
        20  A    I believe Mr. Baum had departed.
```

13. PAGE 113:21 TO 113:25 (RUNNING 00:00:17.100)

```
        21  Q    We mentioned a little bit about the simulated
        22  framebuffer.  Were you aware of any other work at SGI on
        23  a simulated framebuffer other than the one that you did?
        24  The simulated floating point framebuffer?
        25  A    No.
```

14. PAGE 114:01 TO 114:08 (RUNNING 00:00:33.700)

```
00114:01  Q    In the demise of Bali, did you disagree with the
        02  decision?
        03  A    No.
        04  Q    Were you disappointed by the decision?
        05  A    Yes.
        06  Q    Did you and Dr. Airey have different views on
        07  whether the decision to cancel Bali was the right one?
        08  A    I don't know.
```

TOTAL: 1 CLIP FROM 1 DEPOSITION (RUNNING 00:16:57.700)

📁 **DREBIN, ROBERT (Vol. 01) - 03/21/2007**   1 CLIP (RUNNING 00:08:19.200)

📄 invalidity

3 SEGMENTS (RUNNING 00:08:19.200)

1. PAGE 122:15 TO 123:11 (RUNNING 00:01:44.900)

```
15          Q.   Okay.  And do you recall any other ideas or
16     projects or anything that you worked with Mark Peercy
17     on?
18          A.   I think pertaining to this patent, that we had
19     a discussion on high dynamic range.
20          Q.   High dynamic range.  All right.  Why does that
21     pertain to this patent; when you say "this patent," you
22     mean the '327 patent?
23          A.   Let me get the right -- yes.
24          Q.   Okay.  What do you recall about that
25     discussion?
00123:01    A.   I recall discussing Greg Ward's work on high
02     dynamic range in his radiance package.
03          Q.   And you remember discussing that with who?
04          A.   I believe I had a discussion with Mark Peercy
05     and I believe John Airey on that subject.
06          Q.   And when did this discussion take place; do
07     you have any idea?
08          A.   I don't remember.
09          Q.   It was while you were an employee of Silicon
10     Graphics, right?
11          A.   Yes.
```

2. PAGE 124:22 TO 127:04 (RUNNING 00:03:48.800)

```
22          Q.   All right.  Is there anything else you can
23     tell me about that conversation other than the fact that
24     the three of you discussed Greg Ward's paper and this
25     color format?
00125:01    A.   I believe we had a discussion on his noted
02     comments on the limitations or the -- you know, not
03     limitations, but what he -- his observations on -- Greg
04     Ward's observations on the format.  And we had a
05     discussion on what -- how many bits -- if you were in a
06     different format, and I don't remember who, you know, I
07     don't remember the starting thing because I don't really
08     remember why -- how I became involved.  But how many --
09     you know, Greg Ward made the observation that 8-bits of
10     exponent was overkill for color.
11          Q.   Okay.  That's what Greg said in his paper.
12          A.   Yes.
13          Q.   And I'm asking you, what do you recall about
14     the conversation?
15          A.   So then what would be a -- I believe we
16     discussed a format.  What format in terms of what would
17     be the right number of bits of exponent.
18          Q.   For color?
19          A.   For color.
20          Q.   And what did you guys decide?
21          A.   I believe -- I believe we came up with for a
22     16-bit word for lighting, that a 5-bit mantissa --
23     excuse me, a 5-bit exponent and an 11-bit exponent.
24     Excuse me.  10-bit.  Sorry.  10-bit mantissa, 5-bit
25     exponent, would be a good tradeoff.
00126:01    Q.   And when you said "we came up with that," how
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02   did you come up with that?
03        A.   I don't remember.
04        Q.   But it was during the discussions with John
05   Airey and Mark Peercy that this concept came up?
06        A.   I believe the concept came up during
07   discussions with Mark Peercy and John Airey.
08        Q.   With you being part of those conversations.
09   Do you recall where the conversation took place?
10        A.   At -- the conversation took place at SGI.
11        Q.   Do you remember where at SGI?
12        A.   I believe it was in Building 7.  I'm not sure.
13        Q.   I'm curious.  Do you have any sort of
14   particular specific recollection about where it took
15   place?
16        A.   I believe -- I have a vague recollection of a
17   conference room.
18        Q.   Do you have a recollection of who else was
19   attending the meeting?
20        A.   I thought it was -- I thought that discussion,
21   which was an informal discussion, was those two.
22        Q.   You don't know if anybody else was there or
23   not?
24        A.   I don't remember anyone else being there.
25        Q.   Do you remember the context of the discussion
00127:01   any more than what you have just relayed to me, other
02   than the fact that you were talking about Greg Ward's
03   paper?
04        A.   No.
```

3. PAGE 127:14 TO 129:02 (RUNNING 00:02:45.500)

```
14        Q.   Well, my question is, were you discussing
15   rasterization with John Airey and Mark Peercy in that
16   conference room that day?
17        A.   I don't believe so.
18        Q.   Were you discussing storing data in a
19   framebuffer?
20        A.   I don't believe so.
21        Q.   Were you discussing geometric process of data?
22        A.   I don't believe so.
23        Q.   It was merely a discussion about what format
24   might be advantageous for color values?
25        A.   I think I understand, I just want to make sure
00128:01   I heard the question.
02        Q.   The discussion was on what would be an
03   advantageous format for color values.
04        A.   I believe the discussion was on a format or
05   really a distribution.  How much precision in range
06   tradeoff would be best for high dynamic range.
07        Q.   For color values.
08        A.   For color values, yes.
09        Q.   And instead of 8-bit for an exponent, you,
10   John and Mark concluded 5-bit would be better?
11        A.   No.  Well, no, Greg Ward noted that 8-bits was
12   overkill.
13        Q.   Right.
14        A.   And he was likely constrained to trying to
15   work with -- since his product was a software renderer,
16   it was an easy format to work in bytes.  And so my
17   recollection was discussing, when he made the
18   observation, that I think he makes an observation that
19   the brightness between the darkest thing we can see and
20   the sun is some power of two.  And I think that that
21   was -- I think that came into the range where a 5-bit
22   exponent was -- at least that's my memory of that.
23        Q.   So the discussion was about a Ward paper that
24   dealt with software rendering and the dynamic range that
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        25   he was commenting on in that paper?
00129:01        A.   We were discussing the representation of
        02   color.  We weren't talking about a software renderer.
```

📁 **Leather, Mark (Vol. 01) - 12/07/2007**   1 CLIP (RUNNING 00:05:58.100)

🎬 invalidity

ML-*   10 SEGMENTS (RUNNING 00:05:58.100)   ‖‖‖‖‖‖‖‖‖‖‖‖‖

1. PAGE 6:20 TO 6:25 (RUNNING 00:00:19.200)

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        20          And I would like you to start, if you
        21   could for me, by giving me your full name and also
        22   your current home address.
        23        A.   My full name is Mark Marriott Leather.
        24   The home address is 265 Montclair Road, Los Gatos,
        25   California.
```

2. PAGE 14:10 TO 14:18 (RUNNING 00:00:30.700)

```
        10        Q.   Okay.  And so in 1989 you joined Silicon
        11   Graphics.  And how long did you work there?
        12        A.   Approximately eight years.
        13        Q.   So do you recall the date that you
        14   departed Silicon Graphics?
        15        A.   I don't recall the exact date.
        16        Q.   It would have been approximately 1997 at
        17   some point?
        18        A.   It was sometime in 1997.
```

3. PAGE 26:12 TO 26:21 (RUNNING 00:00:37.600)

```
        12        Q.   In designing rasterization circuits, is
        13   there any way to simulate their performance before
        14   tapeout?
        15        A.   Yes, there is.
        16        Q.   And how do you do that?
        17        A.   The RTL code that defines the logic can
        18   be simulated.
        19        Q.   And that simulation is done on a computer
        20   system?
        21        A.   Yes.
```

4. PAGE 27:02 TO 27:19 (RUNNING 00:01:10.700)

```
        02        Q.   And what was the purpose of doing the
        03   simulations on a workstation?
        04        A.   The main purpose was for functional
        05   completion.
        06        Q.   Was one of the purposes to confirm
        07   that the design would perform effectively without
        08   investing in the manufacturer of the dies for the
        09   foundry?
        10        A.   That was the goal.  It didn't always
        11   happen.
        12        Q.   All right.  But that -- is that simulation
        13   practice still continued today?
        14        A.   Yes, it is.
        15        Q.   So as you design your latest graphics
        16   chips, you would still typically attempt to simulate
        17   them in advance of sending the tape to the -- or the
        18   tapeout to the foundry?
```

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```
        19      A.    Yes.
```

5. PAGE 55:19 TO 55:20 (RUNNING 00:00:05.000)

```
        19      Q.    Do you know Mark Peercy?
        20      A.    Yes.
```

6. PAGE 56:06 TO 56:24 (RUNNING 00:01:37.200)

```
        06      Q.    Were you aware of his work at SGI on the
        07 Bali project?
        08      A.    Yeah.
        09      Q.    And what were you aware of?
        10      A.    I know that he had done some research into
        11 some ideas and concepts that got incorporated into
        12 the design.
        13      Q.    And what ideas and concepts are you aware
        14 of that he did research on?
        15      A.    So this would be the idea of multipassing
        16 data through the frame buffer.
        17      Q.    Okay.  Was it your understanding that that
        18 involved the use of floating point formatted data in
        19 the multipass operation through the frame buffer?
        20      A.    Yes, that was my understanding.
        21      Q.    And did you understand that that was his
        22 concept that he was working on at SGI?
        23      A.    I believe it was him and John Airey who --
        24 together.
```

7. PAGE 59:25 TO 60:05 (RUNNING 00:00:12.000)

```
        25      Q.    Okay.  But do you recall the use of a
    00060:01 floating point frame buffer as it related to Bali?
        02      A.    Yes.
        03      Q.    And that was Dr. Peercy and Dr. Airey's
        04 work?
        05      A.    Yeah.
```

8. PAGE 130:18 TO 130:20 (RUNNING 00:00:08.600)

```
        18      Q.    All right.  Did you know of any other
        19 floating point frame buffers that were built at
        20 SGI during that time period?
```

9. PAGE 130:22 TO 131:02 (RUNNING 00:00:27.400)

```
        22            THE WITNESS:  So there was another project
        23 going on at the same time at Bali in a different
        24 division, and I don't know the internal code name
        25 for that project.  But it was a low end product.  It
    00131:01 was designed to target the $10- to $20,000 product
        02 rather than the half million.
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10. PAGE 131:18 TO 132:10 (RUNNING 00:00:49.700)

```
        18      Q.    Well, let me ask you this.  Did you
        19 actually see a second floating point frame buffer
        20 design at SGI?
        21      A.    Well, my recollection was that this other
        22 project also had a floating point frame buffer.
        23      Q.    And why do you recall that?  What do you
        24 recall about it?
        25      A.    Just that the work that Airey and Peercy
    00132:01 were doing was the -- it wasn't just specific to
        02 Bali.  It was a direction for SGI.
        03      Q.    Okay.  So this other work was an extension
        04 of Airey and Peercy's work --
        05      A.    Yeah.
        06      Q.    -- in a different direction?
        07      A.    Yeah.
```

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```
08      Q.   Okay.  Any other floating point frame
09 buffer you were aware of at SGI?
10      A.   No.
```

📁 **Loh, Danny (Vol. 01) - 11/09/2007**   1 CLIP **(RUNNING 00:07:23.900)**

🎬 DANNY LOH, ...

DL-*   8 SEGMENTS (RUNNING 00:07:23.900)   ‖‖‖‖‖‖‖‖‖

1. PAGE 7:06 TO 7:13 (RUNNING 00:00:12.200)
```
06                   DANNY LOH,
07          The deponent herein, was sworn and
08          testified as follows:
09
10                 EXAMINATION
11 BY MR. BOLLINGER:
12      Q.   Good morning, Mr. Loh.  How are you?
13      A.   Good.
```

2. PAGE 8:02 TO 8:11 (RUNNING 00:00:30.700)
```
02      Q.   Is there -- can you give me your current
03 address.
04      A.   910 Continental Drive, Menlo Park.
05      Q.   All right.  Are you currently employed?
06      A.   Yes.
07      Q.   And who do you work for?
08      A.   I work for Adobe System.
09      Q.   All right.  And how long have you worked
10 for Adobe System?
11      A.   Since early February of this year so...
```

3. PAGE 32:09 TO 32:20 (RUNNING 00:00:42.600)
```
09           And what project did you work on when
10 you came back to work with Dan the second time at
11 Silicon Graphics?
12      A.   It was on a project code name Bali.
13      Q.   Okay.  And what did he ask you to help on
14 the Bali project?
15      A.   I had two roles:  One is software
16 engineering manager; and the second role was I
17 was an IPPD, which stands for Integrated Product
18 something -- Product -- Process -- Integrated
19 Product Process Development.  That's right.  I
20 was a software representative to the IPPD team.
```

4. PAGE 36:04 TO 36:11 (RUNNING 00:00:39.900)
```
04      Q.   Well, what aspects of the technology were
05 you responsible for as a manager?
06      A.   I see.  So the software group has two
07 responsibilities in the development of Bali:  One --
08 and it depends on different phases in the project.
09 So the early phase we were actually responsible for
10 writing software simulators to simulate the graphics
11 pipeline.
```

5. PAGE 39:01 TO 39:18 (RUNNING 00:01:36.500)
```
00039:01      A.   So the question you asked me before, did I
      02 work with John Airey on the floating point on Bali?
```

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```
03      Q.   Right.
04      A.   Yes.
05      Q.   Okay.  What do you remember working on?
06      A.   So this is primary, the first time I
07 worked for SGI, this is prior to my departure.
08      Q.   Okay.
09      A.   I worked on the -- let's see if I
10 remember.  Oh, I remember.  So I wrote sort of the
11 simulation framework to evaluate floating point
12 formats in the frame buffer.  Yeah.
13      Q.   Okay.  Was that to -- was that simulation
14 to examine the use of s10e5 as a possible format?
15      A.   Yes, that includes that.
16      Q.   And that was -- you were doing that work
17 with John Airey?
18      A.   With John Airey and Mark Peercy.
```

6. PAGE 40:04 TO 40:17 (RUNNING 00:01:25.500)

```
04           Let me have marked as the next exhibit a
05 document with Bates Nos. S0907786 to S0907788.
06           (Whereupon, Plaintiff's Exhibit 180
07           was marked for identification.)
08 BY MR. BOLLINGER:
09      Q.   And before you get too far into the
10 document.  It's a highly confidential document.  I
11 just want to make sure that the "Danny" referenced
12 in the very first paragraph is -- do you understand
13 that to be you?
14      A.   Yes.
15      Q.   Okay.  Do you remember doing this
16 comparative test?
17      A.   Yes.
```

7. PAGE 41:03 TO 41:25 (RUNNING 00:01:31.500)

```
03      Q.   Okay.  What do you recall about arith.c?
04      A.   Arith.c is a software program that
05 provides the framework to investigate precision --
06 extended range and precision -- extended range
07 precision of -- let me see.  It's a long time ago.
08           Yes.  So arith.c is the framework which
09 allows you to experiment with different types of
10 arithmetic.
11      Q.   Okay.  In here the discussion of s10e5,
12 what does that mean, "s10e5"?  Can you describe
13 what that nomenclature refers to?
14      A.   Yes.  That specified the representations
15 of numbers.
16      Q.   Okay.  So what does it actually mean,
17 though?  It's a 16-bit number?
18      A.   So here it's a 16-bit number.  "S10" refer
19 to one part of a number, and "e5" refer to the --
20 you know, how many bits you dedicate for each
21 moment, how many bits you dedicate for the mantissa.
22 Yeah.
23      Q.   Okay.  So the "10" refers to the bits
24 dedicated to the mantissa?
25      A.   I think so, yeah.
```

8. PAGE 42:01 TO 42:11 (RUNNING 00:00:45.000)

```
00042:01      Q.   What does the "s" stand for?
02      A.   The "s" stands for assign bit.
03      Q.   How do you designate the bias in that
04 particular expression?
05      A.   Yeah.  Let me think about that.  That's a
06 very difficult question.
```

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```
07        Q.   All right.  Do you recall what bias
08   you were operating on when you were doing these
09   experiments?
10        A.   Yeah.  We actually experimented with quite
11   a few biases.
```

TOTAL: 3 CLIPS FROM 3 DEPOSITIONS (RUNNING 00:21:41.200)